

THE ATTRACTIVENESS OF A TOPIC APPROACH TO IMPROVING PEDAGOGICAL CONTENT KNOWLEDGE OF TEACHERS – LESSONS FROM RESEARCH IN SOUTH AFRICA

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It is thirty-four years since Lee Shulman drew the education research community's attention to the importance of explicit inclusion of content knowledge in both pre and in-service teacher education. To address this gap in our understanding of teacher knowledge he introduced the idea of pedagogical content knowledge (PCK) which was embraced with enthusiasm, particularly in the science education community. However, diverse interpretations about the nature of PCK and its relation to content knowledge followed. Since then, consensus has been sought to reach a unified understanding of the PCK construct through intensive discussions by researchers at two PCK summits held in 2012 and 2016, most recently resulting in a refined consensus model of PCK, published in 2019. PCK is theorised as powerful knowledge possessed by teachers, which enables them to transform content into a form that is easily understood by their students. It is tacit knowledge, which is thought to be acquired largely through experience. This talk provides a review of PCK models through the years culminating in a consideration of the power of conceptualising PCK at the topic level, known as Topic Specific PCK, or TSPCK. Consideration of PCK at the topic level has allowed researchers to look more closely at the some of the root causes of poor performance of South African students in science, which has been broadly blamed on teachers' poor content knowledge. The research described in this talk is driven by an attempt to improve both novice and experienced teachers' PCK through topic specific interventions. To measure the success of these interventions, validated pairs of instruments measuring CK and TSPCK have been designed to establish baseline knowledge of teachers in eight topics, two in physics and five in chemistry. The interventions have been very effective, improving teachers' TSPCK as well as their content knowledge. There is also evidence that the interventions enhance the teachers' ability to apply the tools used in the intervention to topics, which were not the subject of the interventions, now known as signature interventions. Further research has shown that pre-service teachers who have been exposed to signature interventions during their teacher education after qualification perform better than those who have not. The TSPCK research group at Wits University has produced 22 refereed articles and 35 masters and doctoral theses collecting evidence on topic specific PCK, the construct used as a lens to capture and measure PCK and investigate the effectiveness of interventions. The talk will also provide samples of data giving insights to the effectiveness of the approaches used in the research as well as the various methods of analysis used. The talk will conclude by looking at international collaborations currently under way and plans for future research.

Reference Papers:

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